

## A Campus Framework: *The Idea of Consolidation*

Chapter 2 begins with a discussion of the importance of facilities choices in achieving the larger agenda for change when NASA was created. This chapter is the story of how, four decades later, GSFC is again using a facilities planning process to foster a larger agenda for change. Prior chapters explored Goddard’s mission and current resources. Here the process begins with these sources and ends with a description of a framework for change at GSFC. Along the way, it clarifies mission objectives, records a program of needs for an evolving organization, identifies facilities objectives, and documents options. The chapter concludes by describing key features of the resulting framework.

The process begins with a programming phase, defining goals and describing requirements for success. The programming phase for Goddard’s Master Plan is called Future Visioning, the translating of the organization’s evolving strategic mission into a documented facilities program. Facilitated by master planners, a broad spectrum of mission leaders used preparatory research, participatory workshops, senior leadership guidance, and scenario modeling tools to document the path GSFC has chosen to live up to an aggressive Agency and Center strategic plan.

This chapter begins by recording Goddard leaders’ Mission Objectives (Section 3.1) and their direction on a Program of Needs (Section 3.2) for major activities; facilities planners rounded out this program with specifics and with needs for supporting activities and systems. As the program took form, planners translated Mission Objectives into Master Plan Objectives (Section 3.3). Next, they developed and explored Land Use Concepts (Section 3.4) leading to the selection of a concept called the Preferred Scheme, refining it into the Campus Framework (Section 3.5), a set of proposed ideas and relationships of key site systems.

### 3.1 Mission Objectives

Agency and Center strategic plans guide GSFC’s top-level decision-making, but the meaning of these “broad brush” documents may not be fully clear to planners of resources like facilities. During Future Visioning, Center leaders summarized their objectives in terms more directly useful for this plan:

Mission success starts with safety. Risk is a part of GSFC’s mission, but risks must be managed. While some risks are

necessary, others can be avoided. GSFC seeks to eliminate unnecessary risks from its work wherever possible.

Focus on performance. To remain both efficient and effective, GSFC balances a need for performance and value, often described as “science for the dollar”, against a need for flexibility: the “reserve capacity” to ensure resilience in the face of accelerating change. Agency and Center strategic plans call for GSFC to deliver increasing value to customers.

Unify the organization. To ensure that a smaller, more agile workforce grows increasingly efficient and effective, Goddard must maximize the effectiveness of its key resource: people. This means removing physical, organizational, and operational barriers from the workplace to enable collaborative, cooperative, creative work.

Optimize Center resources. To meet its strategic objectives, GSFC must ensure that all its resources (people, facilities, technology, and services) are utilized effectively. Since labor is by far the largest on-site expenditure, optimization generally means aligning the other resources, including facilities, closely with the needs of the workforce.

Work more closely with partners. Though important, on-site activities are only about a third of GSFC’s entire budget. Much of the remainder is spent with partners from the public and private sector. GSFC must ensure that offsite partner efforts are also well coordinated to be fully successful in its work.

### 3.2 Program of Needs

The Program of Needs summarizes requirements for the Center’s next twenty years. For GSFC’s major activities, mission leaders generated three sets of requirements during the Future Visioning process:

- Quantitative: How much or many are required?
- Qualitative: What conditions or services are required?
- Configuration: How are activities best arranged?

Through Future Visioning, mission leaders provided direct guidance concerning major activities. Building from this guidance, master planners explored and documented key supporting needs:

- Supporting activities: Shared services and activities supporting employee work and personal needs:
- Utility Systems

- Operational Buffers
- Open Space
- Circulation Systems

#### Key Quantitative Requirements

GSFC employment: Consistent with its strategic planning, GSFC has committed to become more efficient and effective. Over twenty years, Center leadership projects a reduction of about 25% in employment (civil servants and contractors) within GSFC’s security perimeter on a permanent basis, from 7,600 to 5,800. The smaller workforce would use facilities resources more intensely, so the reduction in space is about 10%. These projections are an unusual feature of this Master Plan, since most organizations prepare master plans when they are planning to expand.

Site employment: Goddard’s projected employment and space reductions are based on changing work relationships. Mission Objectives include drawing the workforce as close together as possible. Since working more closely with partners and optimizing resources (including facilities) are also crucial, GSFC proposes designating some of its land and facilities to bring-in about partners on-site. Employment on this designated

part of GSFC’s land is proposed at 1,950. Combined with projected GSFC employment, the resulting site employment total is 7,750, or approximately 2% more than today’s 7,600.

Site employment ceiling: This plan must adjust to continuing mission changes to remain useful over time. This plan makes room for up to 1,000 more employees in response to such changes. Combined with the site employment projection above, the proposed maximum site employment 8,750, unchanged from GSFC’s current ceiling (as recorded in GSFC’s prior Master Plan, adopted by the National Capital Planning Commission in 1991).

#### Key Qualitative Requirements

GSFC reorganized its workforce during the late 1990’s to better align its human resources with its mission strategies. Goddard selected “Core competency” functions for special focus: their performance is most critical to NASA’s long-term success.

Core Competencies include Earth Science, Space Science, and the small part of Engineering that develops science-enabling technologies. These activities routinely require

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facilities to be “state-of-the-art”, allowing few sacrifices that might interfere with these cutting-edge capabilities. Most Earth Science activities moved to state-of-the-art new buildings in the 1990’s, but facilities housing other core competencies occupy fall far short of this standard. Reaching this standard for Space Science and science-enabling technologies activities is crucial to GSFC success.

Other Activities include the rest of Engineering, Program and Project Management, and Institutional functional groupings. These activities enable the Core Competencies, so the Center’s overall success depends on each non-core activity being thoroughly competent. The facilities that house these other activities must match industry standards; being state of the art is only occasionally required. For each of these groupings, current facilities rarely match comparable industry standards. GSFC seeks to renew and reuse existing facilities wherever possible for these activities, building new only where renewal is not cost-effective.

Core competency activities generally have the highest facilities requirements, but all activities require suitable facilities. Recent studies indicate that most Goddard facilities do not meet quality standards for their occupants, whether core competen-



3-1 Facilities Suitability

Meets quality standards

Fails quality standards

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**Eng:** *Engineering and Technology*

**ES:** *Earth Science*

**PM:** *Program/Project Management*

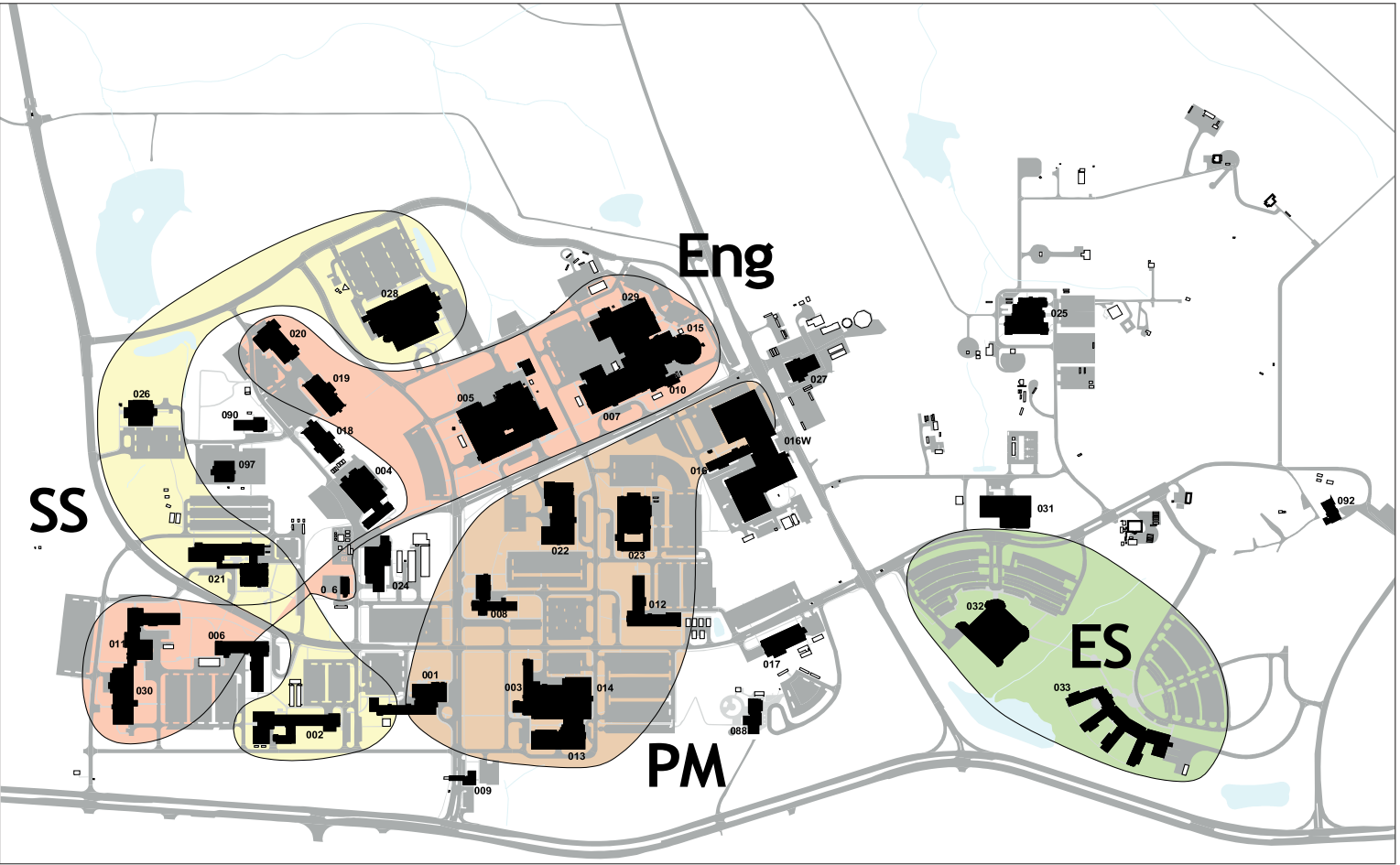
**SS:** *Space Science*

cies or other activities. As illustrated in the **facility suitability** plan (Figure 3-1), major buildings that meet required quality standards for their occupants are shown in black; those that fail these standards are shown in red. Addressing the needs of the many activities in the many red buildings is a key requirement of this plan.

**Key Configuration Requirements**

Strengthen adjacencies among activities: GSFC’s spends about four fifths of its on-site budget on its key resource: a remarkable workforce. Consequently, maximum performance of the workforce is a key to success. Facilities should enhance operational efficiency by bringing like activities closer together, and by removing physical obstructions and unnecessary distance between all activities. The **functional adjacencies** diagram (Figure 3-2) shows that in many cases, related activities are spread across great distances.

Create places to work better with offsite partners: Enhancing coordination with mission partners helps GSFC succeed, but having to drive back and forth reduces the efficiency and frequency of collaboration, and may hinder success. As facilities become available (as current on-site activities are clustered



3-2 Functional adjacencies

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and gradually reduced), keep them fully utilized by locating certain partners on-site. Configure security fences to allow partners to remain outside the security perimeter.

Address risks associated with a divided site. The current east campus/west campus split creates three kinds of risk: person-nel risks to the increasing pedestrian flow across heavy traffic, operations risks of regular flows of utilities, data, supplies, and vehicles out of and back inside security perimeters continu-ously, and mission risks in driving people apart when the goal is bringing them together.

Supporting Activity Requirements

For best results, GSFC’s functional groupings activities need supporting common and special activities. These activities occur today, and some would be largely unaffected by the Master Plan. Others, however, would change in quantity, quality, or configuration as makes most sense given the changes to the overall campus they support.

Work-related common activities provide central services to benefit many functional groups:

<u>Activity</u>	►	<u>Facility Requirement</u>
Research/access to publications		Library
Data access and use		Science Data Center/Visualization Facility
Meetings/presentations		Auditorium/Large Gathering Spaces
Education		Training Center
Display		Exhibition Space
Special outdoor events		Outdoors gathering space

Certain work activities happen best when remote from other activities:

<u>Activity</u>	►	<u>Facility Requirement</u>
Antenna testing		Antenna Test Facility (Area 100)
Miscellaneous research		Goddard Geophysical and Astronomical Observatory (Area 200)
Magnetic testing		Magnetic Test Site (Area 300)
Propulsion testing		Propulsion Test Site (Area 400)
Miscellaneous training		Designated outdoor areas
Facilities staging		Designated areas for equipment, supplies, and
stockpiles		

Visitor-oriented activities that require access from outside of GSFC's security perimeter:

<u>Activity</u>	►	<u>Facility Requirement</u>
Educational Outreach		Visitors Center
Access to secure areas		Badge issuing Facility

Campus Amenities provide employees with convenient personal services and recreation:

<u>Activity</u>	►	<u>Facility Requirement</u>
Food Services		Vending, Snack Bars, Cafeterias, etc.
Retail		Store, Post Office, etc.
Banking		NASA Federal Credit Union, cash machines
Family Care		Child Development Center
Health care		Health Unit
Recreation, culture, athletics		Fitness Center, Recreation Center, Clubs facilities
Outdoor athletics		Athletic fields/courts
Outdoor cultural gatherings		Outdoor gathering space

Utility System Requirements

Current utility service type and capacity is adequate for current on-site activities and projected changes. Central generation capabilities for power, central heating, and central cooling, constructed or renewed since the late 1980's, are a good fit to Center needs. Central utility site distribution systems include some bottlenecks, but are generally appropriate to the requirements. Chilled water and steam distribution systems were installed or renewed since 1990, and plans are proceeding for water and other secondary utilities.

New east campus utility systems distribution uses underground tunnels, which are superior to the duct bank or direct burial of utilities that prevail elsewhere on-site. Wherever practical, extend tunnels for major new construction served by east campus utilities systems. A 2000 study proposed retrofitting new tunnels in west campus utilities corridors. The proposal is not recommended, because implementation would impact customer operations, and the payback period exceeds fifty years.

Operational Buffer Requirements

To be fully successful, some activities in Areas 100, 200, 300, and 400 require isolation. The activities and buffer requirements for these remote sites are projected to continue unchanged. These sites, their operations, and the buffer requirements are all detailed in the Environmental Assessment.

Area 100 antenna testing requires avoiding external radio and radar sources, and signal reflections caused by large moving vehicles in the vicinity. A buffer 1,000 meters in radius, in which traffic is light or restricted, is the best insurance against interference.

Area 200 optical and laser activities are sensitive to vibration and light pollution at night. Sensitive calibrations would not be feasible should development occur near this site.

Area 300 magnetic testing requires avoiding external magnetic fields, such as those generated by automobiles. The entire site constitutes a buffer around the activity.

Area 400 propulsion testing uses hazardous materials, and external vibrations can interfere with tests. The entire site is maintained as a buffer, ensuring a considerable safety factor to ensure that risks are minimized.

Open Space Requirements

Prince George’s County has placed GSFC and its federal neighbors in a new zoning category called “Reserved Open Space”. In keeping, GSFC is committed to maximizing the portion of its site to be preserved and enhanced as open space, preferably woodland in natural condition.

Circulation Systems Requirements

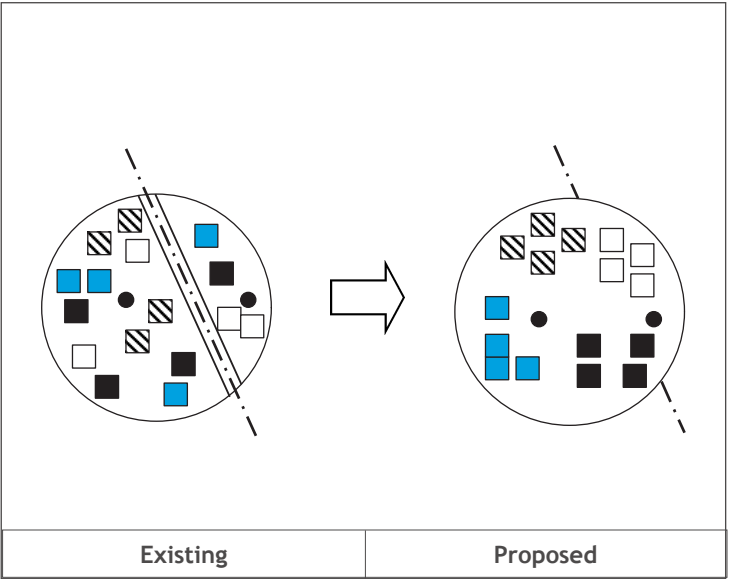
GSFC circulation systems must enable safe, efficient, cost-effective, flexible, and environmentally responsible travel. GSFC’s circulation systems serve employee and visitor motor vehicles, public and Goddard busses, Goddard service vehicles, pedestrians, and cyclists. These systems are comprised of paved roadways, parking, service areas, and sidewalks, unpaved paths, and bus stops. On rare occasion, helicopters land at GSFC; this requires only clear, level outdoor terrain.

Current circulation systems reflect patterns that made sense when the Center was new: automobiles predominate; pedestrian and cyclist traffic are mostly afterthoughts, and auto traffic conflicts with pedestrian and cyclist traffic. This plan must improve accommodations for each kind of traffic, minimize conflicts among them, and minimize the overall area of paved surface. In response to proposals to consolidate major activities, circulation systems would require substantial changes.

In particular, GSFC seeks to encourage employees to consider alternatives to driving alone to work. This means improving external connections for mass transit users, pedestrians, and cyclists, and for making non-automotive trips within the Center more pleasant and efficient.

GSFC also is responsible to manage the consequences of its transportation choices for the broader community, especially its commuter contributions to area roadway congestion and air pollution. The Transportation Management Plan (Chapter 5) outlines a process of considering and choosing initiatives for GSFC’s transportation system. It is a framework for adapting to changing transportation needs, and specifies GSFC commitments to implement or augment transportation man-

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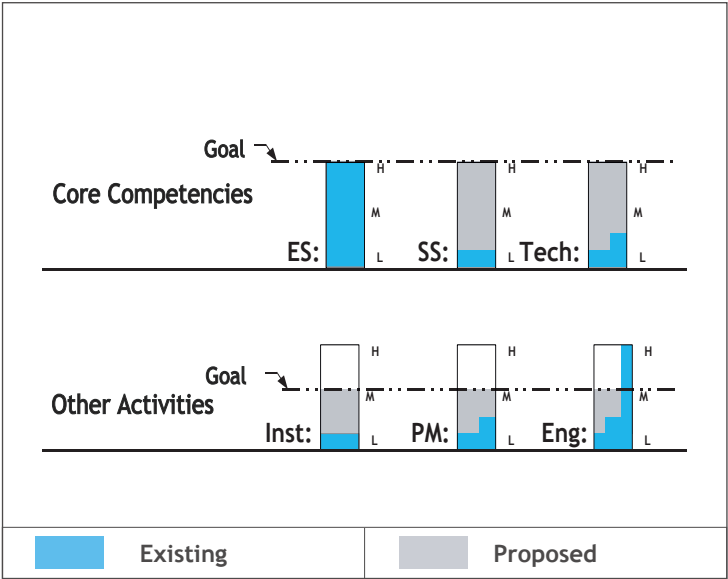
3-3 Safety objective

agement program initiatives. It summarizes this process and records the Center’s intent for all stakeholders (external community, workforce, partners, and mission) to understand.

For reasons detailed in the Transportation Management Plan and the Environmental Assessment associated with this plan, GSFC proposes reducing its ratio of spaces per employee from the current 0.97 to 0.90 associated with near term modifications. Over time, GSFC recognizes its responsibility to further lower the ratio toward the long-term goal of 0.67 spaces per employee in accordance with guidance from the National Capital Planning Commission. Non-employee parking (for visitors, government vehicles, loading, etc.) would be maintained, and bicycle parking would be incorporated as demand warrants.

3.3 Master Plan Objectives

Master planning objectives summarize the expectations of how the facility would change over time. Guided by Center leaders, planners translated mission objectives (Section 3.1) into facilities objectives. Each objective is defined with a key word or phrase:

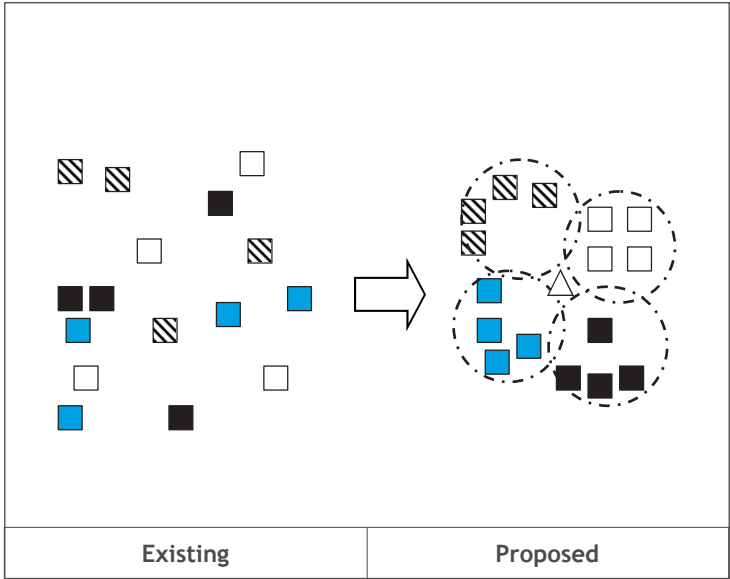


3-4 Quality objective

**Safety** (Figure 3-3) is the facilities response to the mission objective Mission success starts with safety. Specifics include consolidating like activities, keeping central utilities within the secured perimeter, and eliminating other safety risks associated with the current configuration of having two separate security perimeters separated by Soil Conservation Service Road.

**Quality** (Figure 3-4) is the facilities response to the mission objective Focus on performance: provide facilities of appropriate quality to support the mission. Were resources unconstrained, all activities would be provided state-of-the-art facilities. An increased focus on performance, however, means making careful investments tied to the importance of the activity housed. Facilities standards for Core Competencies (Earth Science, Space Science, and the part of Engineering focused on Science-enabling Technologies) shall be state-of the art; facilities standards for other activities shall match industry standards.

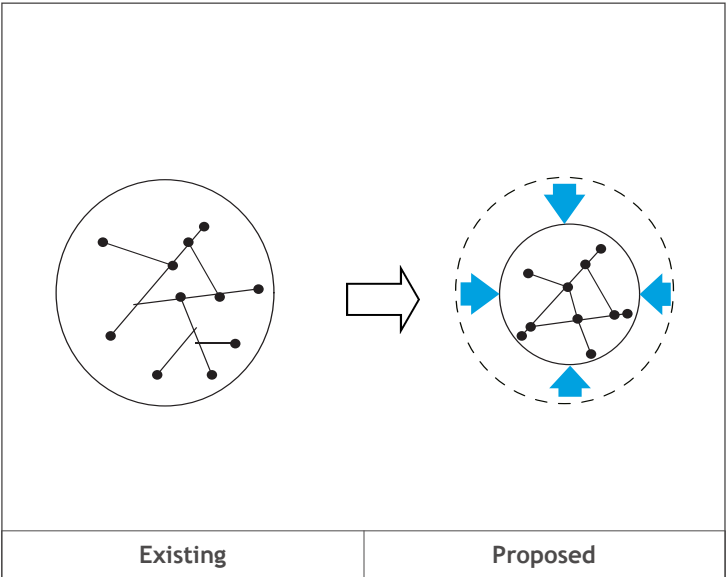
**Unified Campus** (Figure 3-5) is the facilities response to the mission objective Unify the organization: consolidate like functions into neighborhoods, and ensure that all activities are closely connected.



3-5 Unified campus objective

**Efficiency** (Figure 3-6) is the facilities response to the mission objective Optimize Center resources. To maximize the GSFC’s efficiency in a creative, knowledge-based industry, best practices are to maximize interaction among individuals and among activities. Key strategies include aggressive consolidation, lowering facilities and mission operations costs, improving link-ages and communication among activities, improving facilities and infrastructure utilization, and ensuring that facilities capabilities more closely match occupant requirements.

**Partners** (Figure 3-7) is the Master Plan facilities objective for the mission objective Work more closely with partners: wherever opportunities arise, create an integrated institution that works closely with strategic partners including near-site contractors, universities, and governmental agencies. Optimize working relationships by moving near-site strategic mission partners on site, but outside the security perimeter by enhancing available partnering/teaming capabilities, and by maximizing site-wide interaction. In evaluating land use concepts, it is also important that facilities managers consider aspects of their role as stewards of physical and natural resources:



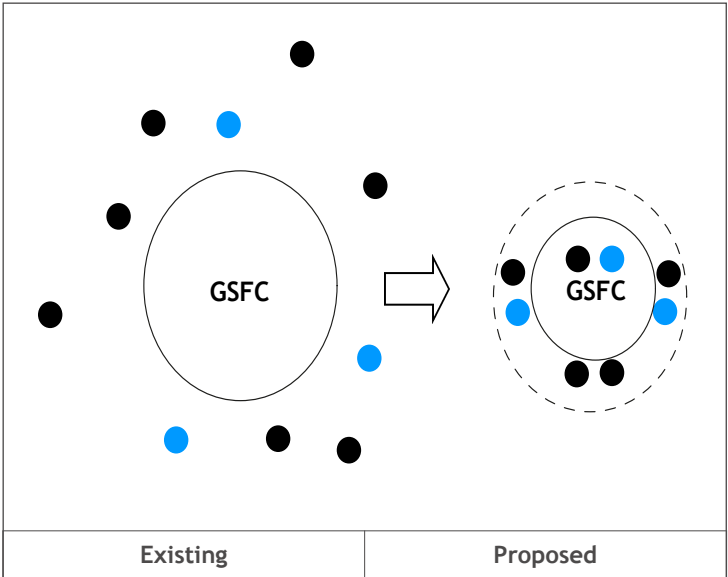
3-6 Efficiency objective

**Flexibility:** Does the plan preserve GSFC’s options to adapt to future changing needs, such as the growth of one or more functions, or even the creation of a functional group to accomplish new mission?

**“Do-ability”:** Can GSFC implement key recommendations over time? Implementation potential of each concept is assessed relative to numerous broad factors including cost, phasing, and impact to continuing operations. Refer to the Environmental Assessment for a detailed report of impacts.

3.4 Land Use Concepts

This section summarizes the process of developing, evaluating, and choosing a land use concept. Working from the program and knowledge of existing opportunities and constraints, several general concepts were proposed, studied, and evaluated in terms of how well they help GSFC meet its mission goals. Next, planners developed several variants of the best concept, and evaluated them in terms of how they work for all plan stakeholders. The results of this process further developed into the Summary Campus Framework.



3-7 Partnering objective

Concept Development

GSFC began by brainstorming site planning ideas and recorded them in a series of preliminary land-use sketches. In reviewing these preliminary sketches, planners identified three key questions:

**Action or No Action?** Any responsible assessment begins with a baseline: “What would be the outcome of taking no action?” After careful assessment, GSFC concluded that taking no action would unacceptably increase the risk that deteriorating facilities could contribute to mission failure.

**Unified or Divided Campus?** The current division of activities is a key constraint, so planners explored ideas to reduce or eliminate this division. Concepts developed include both approaches.

**Reroute Soil Conservation Service Road to Unify Activities or Maintain a Divided Campus?** For divided campus concepts, there would be no need to change the road, but many unified campus concepts would require rerouting Soil Conservation Service Road, moving key mission activities, or both. Concepts developed included both approaches.

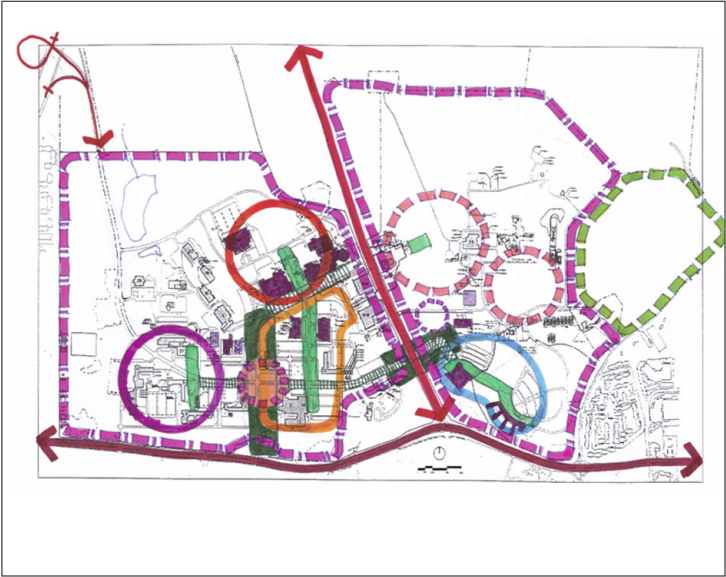
Once these key questions were clear, planners more fully explored and documented five possible master plan concepts. These concepts include unified and divided campus approaches, and rerouted and unchanged Soil Conservation Service Road approaches.

Concept A: Clean Up Status Quo (Figure 3-8). Consolidate major functional groupings to the extent possible without major relocations. Renew facilities in place by renovations and additions. Leave Soil Conservation Service Road in its current alignment.

Concept B: Consolidated Split Campus (Figure 3-9). Maintain most existing land use patterns, but relocate Space Science and Program and Project Management into new facilities.

Concept C: Consolidated West Campus (Figure 3-10). Consolidate all functional groupings to the west campus by relocating Earth Sciences, rebuilding Space Sciences, and consolidating Project Management. Slightly reroute Soil Conservation Service Road.

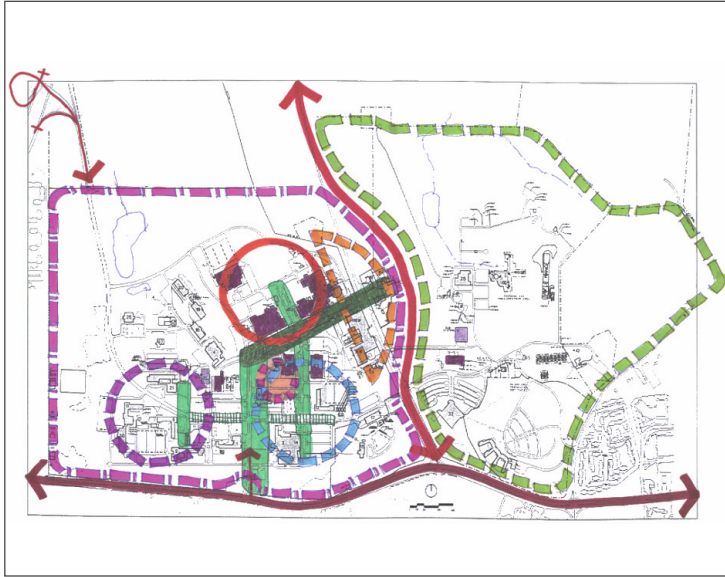




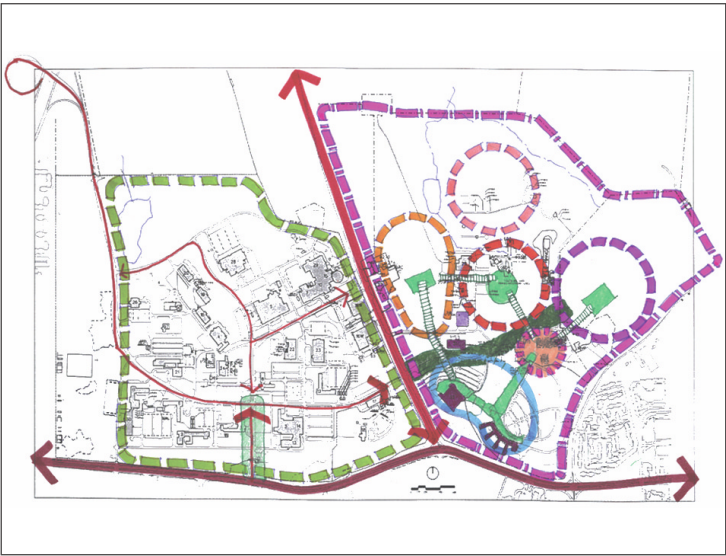
3-8 Clean up Status Quo, Concept A



3-9 Consolidated Split Campus, Concept B



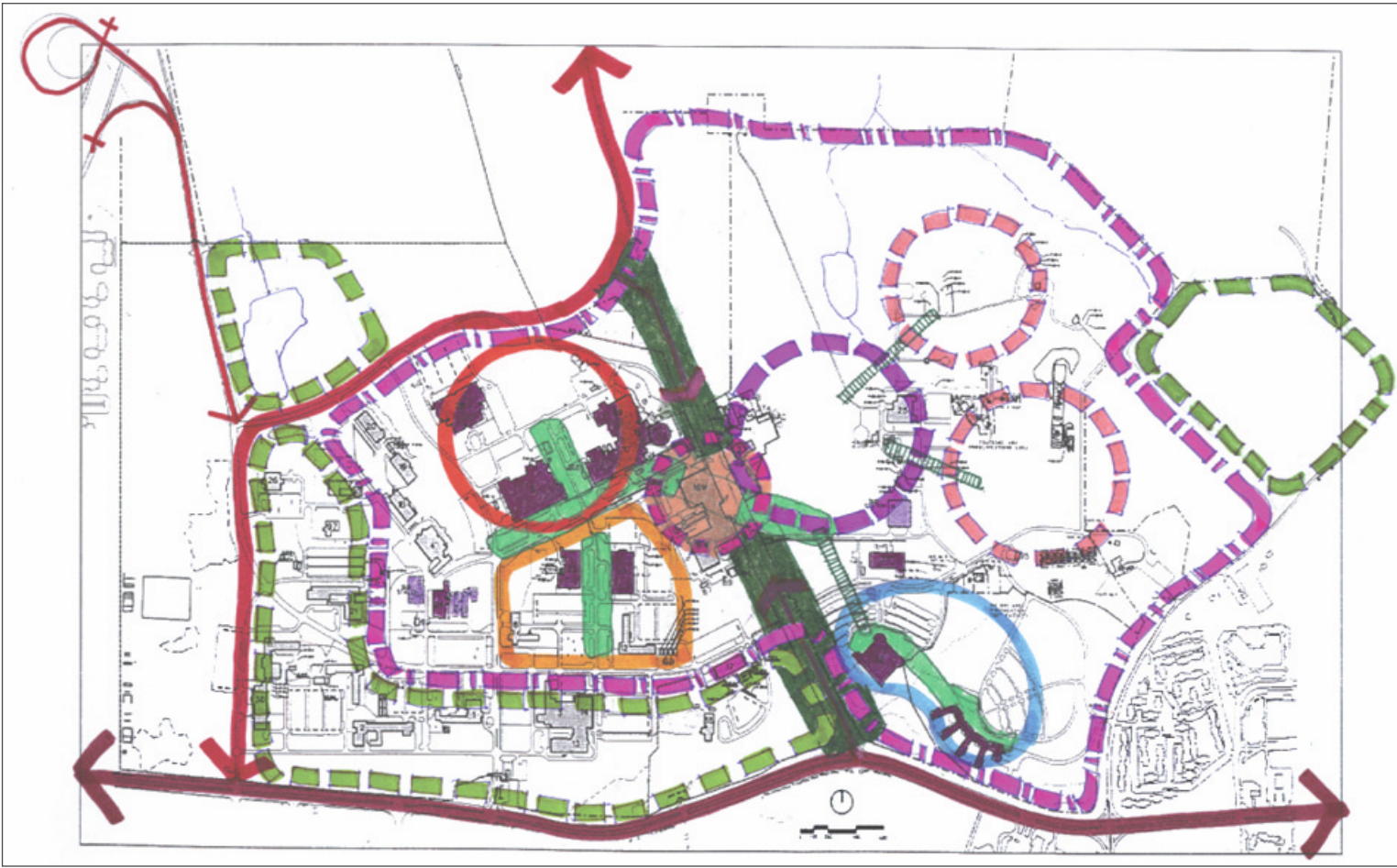
3-10 Consolidated West Campus, Concept C



3-12 Consolidated East Campus, Concept E

Concept D: Consolidated Central Campus (Figure 3-11). Consolidate all major functional groupings. Relocate Space Sciences to new facilities in a new neighborhood, and consolidate Project Management activities. Reroute Soil Conservation Service Road.

Concept E: Consolidated East Campus (Figure 3-12). Relocate all major functional groupings to new facilities on the east



3-11 Consolidated Central Campus, Concept D (Master Plan Alternative)

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	Land Use Concepts					
FMP Goals	A	B	C	D	E	Concept Titles
Mission-Focused						
Safety	○	○	▲	▲	▲	A Clean Up Status Quo
Quality	○	○	○	▲	▲	B Consolidated Split Campus
Efficiency	▲	▲	▲	▲	▲	C Consolidated West Campus
Unified Campus	○	○	▲	▲	▲	D Consolidated Central Campus
Partners	○	○	○	▲	○	E Consolidated East Campus
Feasibility-Focused						
Flexibility	○	▲	▼	▲	○	
"Do-ability"	○	▼	▼	▲	▼	
Benefit Tally	+1	+1	+1	+7	+3	

▲ Significant Improvement

○ Challenge Remains

▼ Condition Worsens

Legend

3-13 Concept Evaluation Preferred Concept

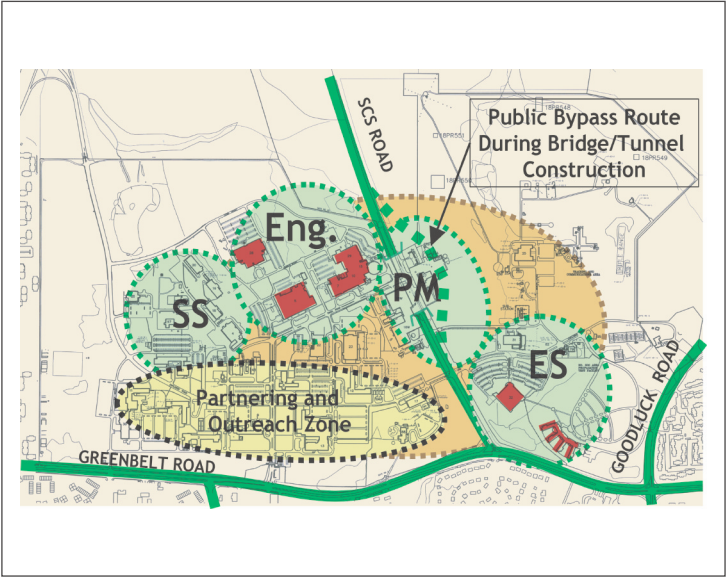
campus (leaving Earth Science in place). Leave Soil Conservation Service Road in its current alignment.

**Master Plan Alternative:** Planners evaluated these land use concepts against the Master Planning Objectives (see Section 3.3 above), and recorded their analysis in a table (Figure 3-13). The table shows how each concept rates against the objectives. The table shows that the highlighted Consolidated Central Campus (Concept D) is the only concept that satisfies the objectives; no other concept comes close. On this basis, Goddard chose the Consolidated Central Campus as its proposed Master Plan Alternative

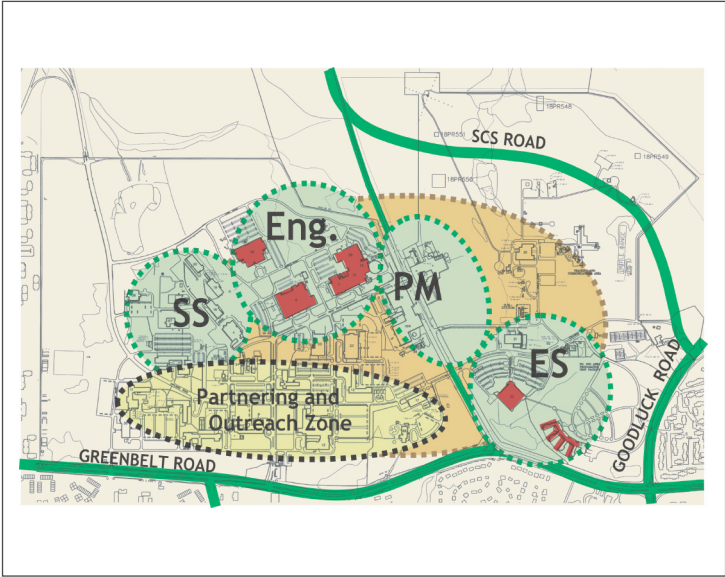
Soil Conservation Service Road Schemes

A master plan is a general land use strategy: there are many possible ways to implement the Consolidated Central Campus. Planners recognized that whether and how Soil Conservation Service Road is changed is key to the success of the plan. In response, specific variants, or schemes, were developed and explored based upon different Soil Conservation Service Road options:

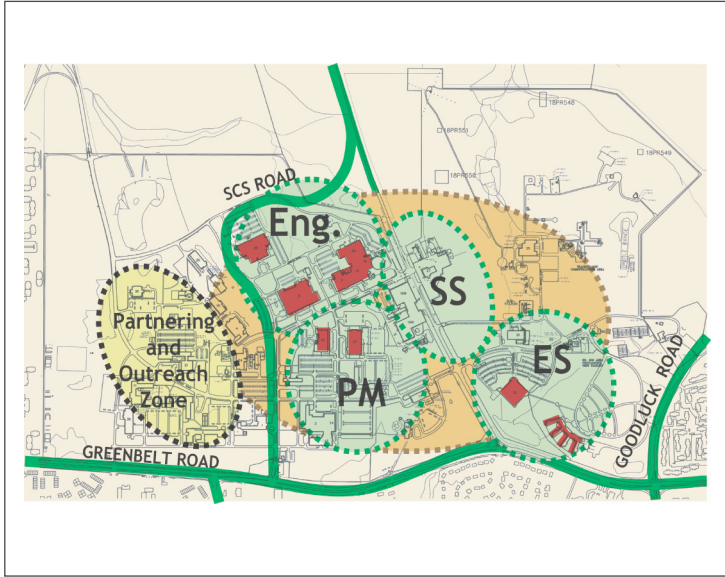
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3-14 Bridge/Tunnel, Scheme D1



3-15 Eastern rerouting, Scheme D2



3-16 Central rerouting, Scheme D3

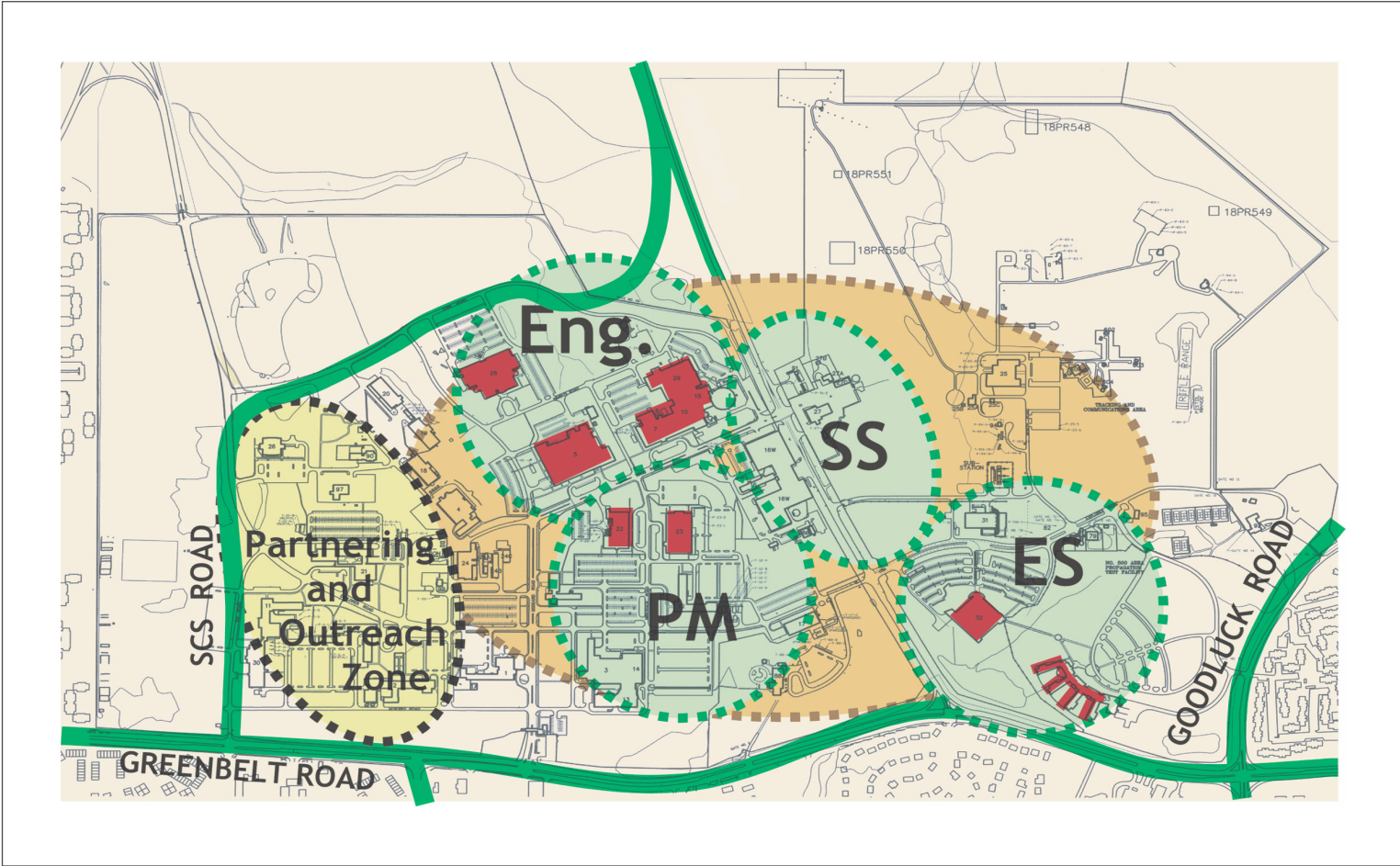
Scheme D1: Bridge/Tunnel (Figure 3-14): Depress Soil Conservation Service Road and build the campus over the top. All site activities are interconnected.

Scheme D2: Eastern Rerouting (Figure 3-15): Reroute Soil Conservation Service Road across the east campus, ending onto Good Luck Road. All site activities are interconnected.

Scheme D3: Central Rerouting (Figure 3-16): Reroute Soil Conservation Service Road along Goddard Road, ending onto Greenbelt Road where GSFC's Main Gate is today. Major functional groupings are interconnected, but supporting activities and infrastructure are across Soil Conservation Service Road

Scheme D4: Western Rerouting (Figure 3-17): Reroute Soil Conservation Service Road across the west campus, ending onto Greenbelt Road at IUE Road. All site activities are interconnected.

Soil Conservation Service Road Schemes were rated against a list of issues. In this rating analysis, issues include both Center and external concerns: internal mission, external community, and challenges of implementation.



3-17 Western Rerouting, Scheme D4 (Preferred Scheme)

Mission-Focused:

- Efficiency: Would the option help GSFC accomplish its work efficiently?
- Security/Safety: Would the option address key GSFC security and safety issues?

Community-Focused:

- Sustainability: How would the option affect the natural environment?
- Traffic Patterns: How would the option affect the transportation network?

Implementation-Focused:

- Relative Cost: How costly would the option be?
- “Do-ability”: How hard would it be to build and use?

**Preferred Scheme:** Because each SCS Road Scheme is based on the Consolidated Central Campus (Concept D), schemes are assessed in comparison to each other (better than average, average, or worse than average) on each issue. Analysis of schemes is summarized in a table (Figure 3-18) detailing how each option rated against these issues. Scheme D4, the Western Rerouting, is highlighted as the most favor-

	Master Plan Schemes				
Considerations	D1	D2	D3	D4	Scheme Titles
Mission-Focused					
Efficiency	○	○	▲	▲	D1 Bridge/Tunnel
Security/Safety	▼	▲	○	▲	D2 Eastern Rerouting
Community-Focused					D3 Central Rerouting
Natural Environment	▼	▼	○	▲	D4 Western Rerouting
Traffic Environment	▲	▲	○	▼	
Implementation-Focused					Legend
Relative Cost	▼	○	▼	▲	▲ Better than Average
"Do-ability"	▼	▲	▼	▲	○ Average
					▼ Worse than Average
Benefit Tally	-3	+2	-1	+4	

3-18 Soil Conservation Service Road Schemes

Preferred Scheme

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able overall outcome. GSFC selected Scheme D4 as its preferred Soil Conservation Service Road Scheme.

Selecting the Western Rerouting (Scheme D4) is more than a part of developing a project to reroute the Road: it also helped planners more fully understand the Master Plan Alternative. Scheme D4 is recorded as a part of the master plan because choosing it was an integral part of master plan development. Further development of the Consolidated Central Campus concept is based on the Western Rerouting.

### 3.5 Campus Framework

Planners refined the preferred scheme to best fit with the needs and resources of the Center, creating a Summary Campus Framework (Figure 3-20). This diagram shows GSFC’s land use proposals to address the Master Plan Objectives and Program of Needs. It is called a framework because rather than an absolute answer, it is the structure, or basic armature, upon which GSFC’s changes will continue to take physical form. The campus framework is described in terms of its implications for key site systems.

Campus Structure: Create a central pedestrian spine linking major activities across the middle of the site, placing food

service (magnets to encourage walking) within a 5 minute walk of nearly everyone, at either end of a set of commons activities. Link the spine through and along buildings and outdoor spaces.

External Vehicular Circulation: Relocate Soil Conservation Service Road to enable other changes that help GSFC meet mission objectives, while maintaining unobstructed access across the site for public traffic. Maintain the existing Baltimore-Washington Parkway interchange for use by Goddard employees.

Building Use and Renewal: Establish “building blocks” (existing facilities either well-suited to current activities, or worth renewing), and add new facilities and additions to provide appropriate quality space for all activities. Over time, invite key outside partners to renew and occupy buildings that no longer serve GSFC effectively in an area called the “Partnering and Outreach Zone.”

Functional Relationships: Develop existing activity concentrations (Earth Science, Engineering, Program and Project Management, and Institutional Support) into neighborhoods, to enhance interaction and collaboration. Link neighborhoods

with a new centrally located Space Science and Commons neighborhood in the middle of what is now Soil Conservation Service Road. As GSFC’s core mission activities are gradually relocated, reconfigure fencelines to create a Partnering and Outreach Zone outside GSFC security for assignment to partners.

Security, Access, and Way-finding: Consolidate the two security perimeters into one. Over time, draw back the perimeter to allow general access to the Partnering and Outreach Zone. Consolidate employee access to three gates, and interconnect them with a well-marked internal loop road. Provide access to each neighborhood from the loop road. Cluster parking for each neighborhood on the opposite sides of buildings from the pedestrian spine. Isolate service access to the Center from through public traffic and from major employee populations.

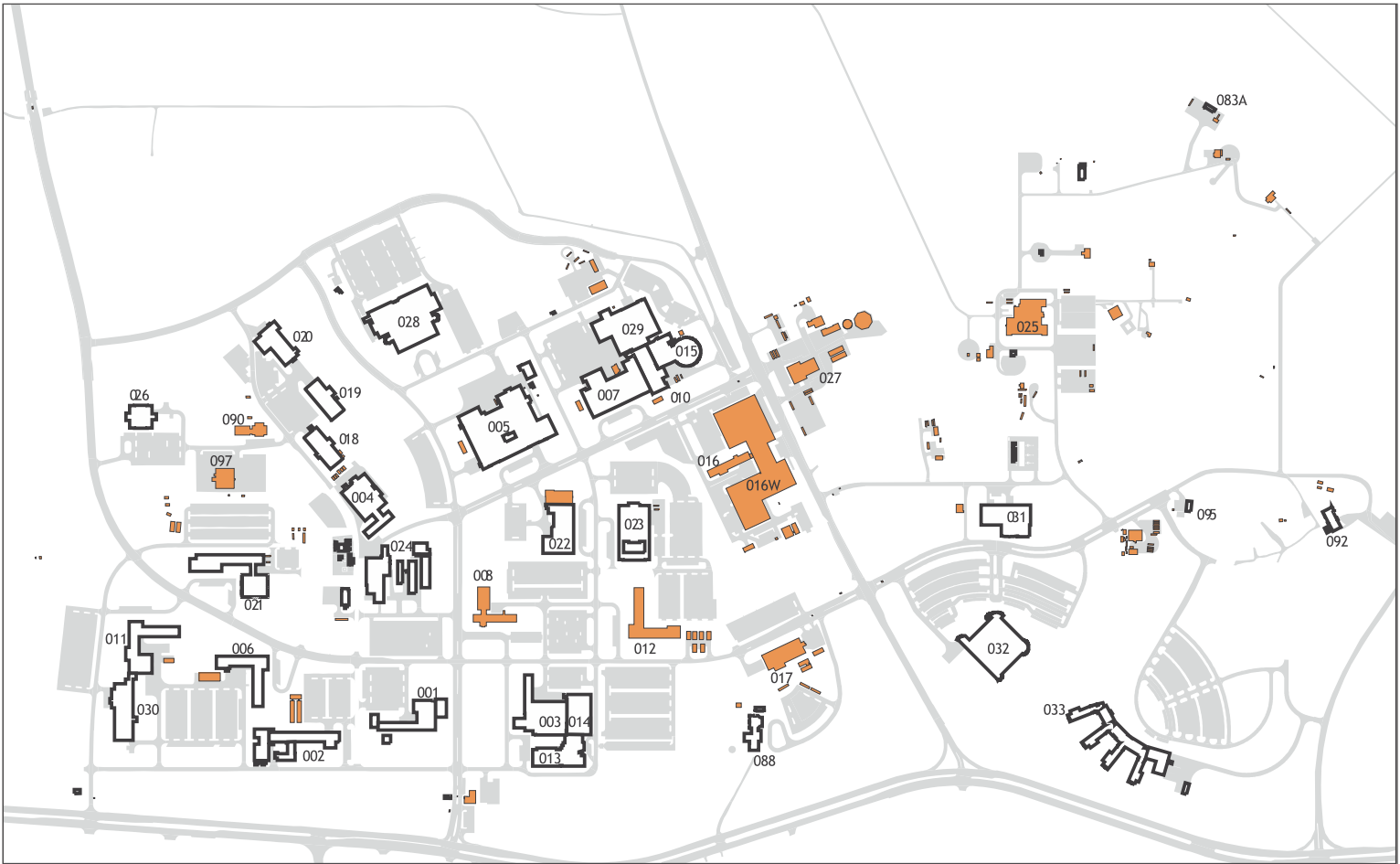
Pedestrian and cyclist Circulation: Use the pedestrian spine to link collaborative and service activities. Connect the spine with external sidewalks, bikeways, and bus stops. Enhance employee access to natural areas of the site.

Open Space and Landscape: Strengthen the predominant background fabric of mixed woodland and meadow landscapes

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to help Goddard fit better with its federal neighbors. Reinforce the wooded buffer zone that has for so long been a welcome respite in the increasingly dense suburban development along Greenbelt Road.

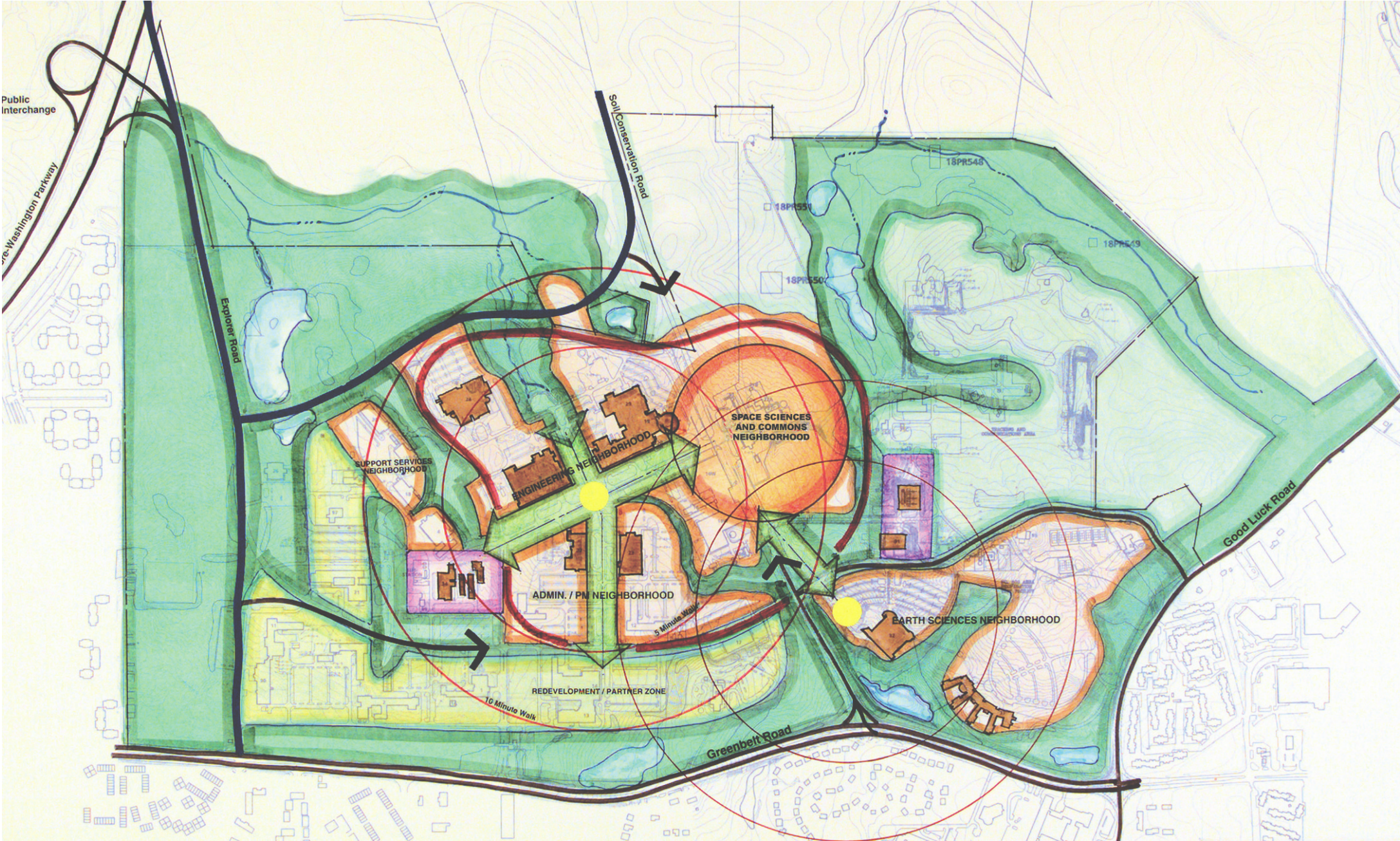
Utilities: Keep utility generation and major distribution systems within GSFC security. Use tunnels for distribution wherever feasible to improve operations and maintenance and reduce the need to relocate utilities when locating new facilities.



3-19 Buildings to be removed

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3-20 Summary campus framework

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